Chapter 2.0: Needs Assessment

For the *Needs Assessment* phase of the *I-15 Corridor Management Plan*, four major activities occurred:

- Collected and analyzed data for existing conditions
- Developed 2030 traffic forecasts
- Gathered input from the public and affected agencies
- Established goals, objectives, and evaluation criteria for the project

The following sections summarize the techniques used to accomplish each of these activities and provide summaries of the needs identified for the I-15 corridor.

2.1 Data Collection and Analysis

As one of the first tasks in the study effort, data were collected to document existing conditions in the I-15 study corridor and to provide information about how travel demand for the corridor would change by the year 2030. This included an inventory of existing traffic lanes on I-15, entrance and exit ramps to I-15, and traffic control at the ramp intersections with local roadways. Population and employment trends were summarized, and extensive data were collected to document existing traffic volumes using I-15 and the roadways with access to and from I-15. The current conditions of all structures and the pavements along I-15 were inventoried, and historical data on traffic accidents/crashes were also collected and analyzed to identify safety issues along the corridor.

2.1.1 Existing and Under Construction Freeway System

I-15 in Utah County has 20 existing interchanges and one new interchange that is under construction. **Figure 2-1** shows the general locations of all interchanges along the I-15 corridor and an aerial photo of each interchange area with the general geometric conditions of the interchange ramps.

At the start of the data collection effort (April 2001), the University Parkway interchange (Exit 272) and the University Avenue interchange (Exit 266) were under construction. The University Parkway interchange was being converted from a diamond configuration to a single-point urban interchange (SPUI), and the University Avenue interchange was being reconstructed to provide access to 1860

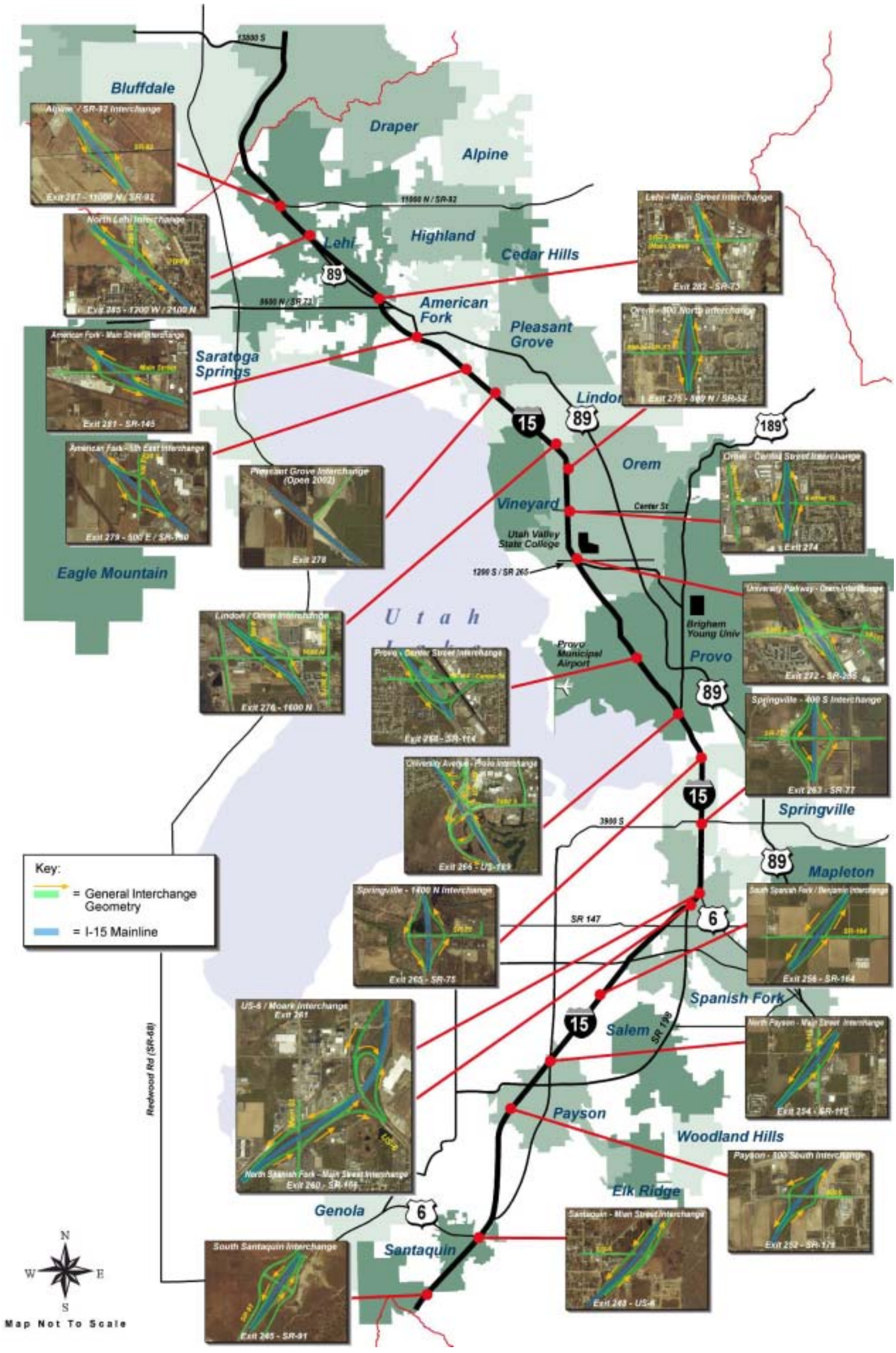


Figure 2-1:
Study Area with Interchange Locations

South Street located on the east side of I-15. In addition, construction was also underway on the I-15 mainline between University Avenue and Provo Center Street interchanges to add an additional general purpose lane. These construction activities were completed by October 2001.

A new interchange is under construction approximately one mile south of the American Fork / 5th East interchange (Exit 279) and is labeled on **Figure 2-1** as the Pleasant Grove interchange, which will become Exit 278. The new Pleasant Grove interchange is being constructed in a diamond configuration and will connect to 6400 North on the west side of I-15 and on the east side will connect to Pleasant Grove Boulevard, a new road being constructed to tie the interchange to State Street. Construction on this new interchange is scheduled to be complete during Summer 2002.

I-15 from the northern Utah County line to the US-6/Moark interchange (Exit 261) is 6 lanes wide (3 travel lanes in each direction) with two sections having an 8-lane cross-section (between Exits 275 and 274 and between Exits 265 and 266). South of the US-6/Moark interchange, the existing freeway cross-section is 4 lanes, 2 travel lanes in each direction.

2.1.2 Transit Service and Park and Ride Facilities

I-15 is the major corridor used by UTA to serve Utah County with inter-regional bus service. A summary of the existing express transit service for Utah County is shown in **Table 2-1**.

Table 2-1:
Existing Inter-regional UTA Bus Service for Utah County

Route #	Route Name	Current Avg. Freq. (min.)		Current Route Description
		Peak	Off-Peak	
801	Provo/Orem/SLC Express	3 trips/pk dir	0	Sears East Bay, University Ave, BYU, University Pkwy, Provo/Orem, 1200S, UVSC, I-15, Downtown SLC, Delta Center TRAX
802	SLC/Lehi/AF/Orem Express	3 trips/pk dir	0	Sears East Bay, University Ave, BYU, University Pkwy, Provo/Orem, 1200S, UVSC, I-15, Lehi, Hwy 89, I-15, Downtown SLC, Delta Center TRAX
803	Spanish Fork Express	2 trips/pk dir	0	Spanish Fork K-Mart, 800E, Center St, Main St, I-15, University Pkwy, 1200S, Campus Dr, UVSC, 1200W, Orem, I-15, American Fork, Hwy 89, I-15, Downtown SLC, Delta Center TRAX
804	Lindon/Orem/PG/SLC Express	2 trips/pk dir	0	State St, Lindon, Pleasant Grove, Hwy 89, American Fork, Hwy 89, Lehi, I-15, Downtown SLC, Delta Center TRAX
810	Orem/American Fork/PG/Lehi to UofU Express	2 trips/pk dir		Orem/Mt. Tipanogos, University, State, Hwy 89, I-15, I-215, Foothill, Research Park, 500S, 1300E, U of U, S. Campus, Wasatch Dr, Medical Center
811	Utah Valley TRAX Connector	30	60	Sears East Bay, University Ave, University Pkwy, UVSC, American Fork, Lehi, I-15, State St, 10000S TRAX

Transit service and carpooling in the I-15 corridor are also enhanced by park and ride lots throughout the county with the locations summarized in **Table 2-2**. Not all of the park and ride lots are adjacent to I-15, but many of the bus routes served by these park and rides use I-15 as a travel corridor.

Table 2-2:
Park and Ride Facilities in Utah County

Park and Ride Location	Number of Parking Spaces	Type of Facility	UTA Routes
I-15 and SR-92 (Exit 287), Frontage Road (Lehi, UDOT)	47	Exclusive use lot	None
Redwood Road / SR-68 and Main Street / SR-73, (Lehi)	33	Exclusive use lot	None
1149 North 300 West (Lehi)	60	Joint use lot with LDS Church	802, 803, 804, 810 and 811
I-15 and Main Street – American Fork (west of I-15) (American Fork, UDOT)	120	Exclusive use lot	None
110 North Main (American Fork)	20	LDS Tabernacle	804, 810, 816 and 850
275 East 500 South (Pleasant Grove)	10	LDS Chapel	804, 810, 816 and 850
800 North / SR-52 and University Avenue / US-189 (Orem)	25	Exclusive use lot	None
1600 North 1200 West at I-15 (Orem, UDOT)	65	Exclusive use lot	803, 861 and 862
800 North 1200 West at I-15 (Orem, UDOT)	65	Exclusive use lot	803
I-15 and Center Street, 1200 West (Orem, UDOT)	58	Exclusive use lot	803
1260 South 400 West (Orem)	40	Joint use lot with LDS Chapel	801, 802, 811, 830, 831 and 861
US-89 / State Street and 1200 North (Lehi)	20 to 30	Joint use lot with LDS Church	802, 803, 804, 811 and 816
240 West State Street (American Fork)	80	Joint use lot with Smith's and K-Mart	802, 803, 804, 809, 810, 811 816 and 850
100 East Main Street (American Fork)	9	Joint use lot with Albertson's & LDS Church	802, 803, 804, 809, 810, 811, 816, and 850

Table 2-2:
Park and Ride Facilities in Utah County (continued)

Park and Ride Location	Number of Parking Spaces	Type of Facility	UTA Routes
1200 South and 424 West Orem	25 to 30	Joint use lot with LDS Church	801, 811 and 830
Transit Center - 1100 South and 800 East (Orem)	65 (estimated)	University Mall lot (no agreement in place)	801, 802, 809, 810, 811, 816, 830, 832, 840, 850, 861 and 862
2244 North University Parkway (Provo)	15	Joint use lot with Shopko	801, 802, 811, 830 and 832
1300 South University Avenue (Provo)	20	Joint use lot with Sam's Club	801, 802, 811, 816 and 840
424 West 1200 South (Provo)	10	Joint use lot with LDS Chapel	832
400 South 1950 West at I-15 (Springville, UDOT)	65	Exclusive use lot	None
310 East Center Street (Spanish Fork)	30	Joint use lot with LDS Chapel	803 and 820
I-15 Frontage Rd Payson, UDOT	90	Exclusive use lot	None
I-15 Main Street (Payson, UDOT)	40	Exclusive use lot	None
1000 North Main / US-6 (Spanish Fork)	28	Joint use lot with Chevron	None

2.1.3 Recommendations from Other Planning Studies

Two separate planning studies recently have been completed which examined portions of the corridor:

- *Inter-Regional Corridor Alternatives Analysis (IRCAA) Study*
- *North Valley Connectors Study (NVCS)*

The IRCAA study was conducted for MAG, Wasatch Front Regional Council (WFRC), UDOT, and UTA with the final report completed in January 2002. The purpose of the IRCAA study was to examine transportation alternatives for north-south corridors between Payson and Brigham City.

Within Utah County, the IRCAA study recommended expansion of the freeway system by adding additional general-purpose lanes north of Payson-Benjamin and a High Occupancy Vehicle (HOV) lane north of University Parkway extending past

the Salt Lake County line to 10600 South. It also recommended a commuter rail line between Salt Lake and Utah County, and the development of a Bus Rapid Transit (BRT) system between the Utah Valley State College (UVSC) campus, Brigham Young University (BYU) and the Provo Town Center Mall. Roadway widening was also recommended for US-89 between American Fork and Orem. A new roadway facility, connecting Salt Lake and Utah Counties to the west of I-15, was also identified, and this new Western Transportation Corridor would eventually link to a new freeway facility in western Salt Lake County. IRCAA recommendations in Utah County are shown in **Figure 2-2.**

The IRCAA recommendations for widening I-15 were used as baseline planning assumptions for the traffic forecasts developed for this study effort. A detailed discussion of the assumptions made is included in Section 2.2, 2030 Traffic Forecasts.

A second study, the *North Valley Connectors Study (NVCS)*, was completed in January 2002 for MAG as a collaborative effort between MAG; UDOT; the local entities of American Fork, Cedar Fort, Eagle Mountain, Lehi, Lindon, Pleasant Grove, Saratoga Springs, and Utah County; and several state and federal resource and regulatory agencies. The purpose of the NVCS was to evaluate the east-west transportation needs in the northwest part of Utah County in the areas west of I-15 and north of Utah Lake. The study recommended development of three east-west corridors north of Utah Lake with connections to I-15 as described below:

- North Recommended Corridor would connect to I-15 at the North Lehi Interchange (Exit 285);
- Central Recommended Corridor would connect to I-15 at the American Fork Main Street Interchange (Exit 281); and
- South Recommended Corridor would connect to I-15 at the new Pleasant Grove Interchange (future Exit 278, scheduled to open in 2002).

More detailed information about specific alignment recommendations for these three corridors is available in the full report on the NVCS. The NVCS report is available from MAG, and information about the study is also available on the Web site for MAG. These three connections from the NVCS recommendations were used as baseline planning assumptions for the traffic forecasts developed for this study effort. A detailed discussion of the assumptions made is included in Section 2.2, 2030 Traffic Forecasts.

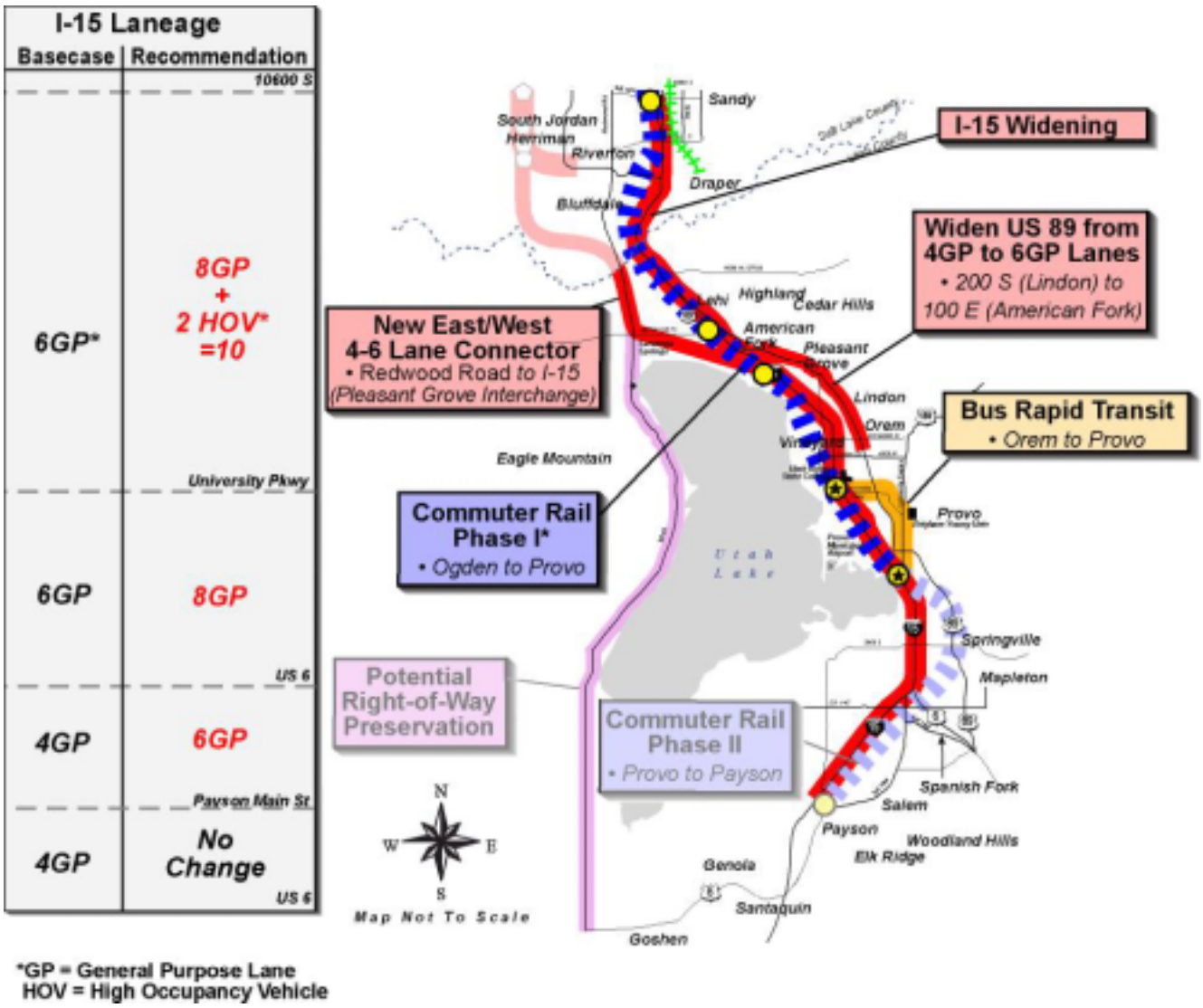


Figure 2-2:
Recommendations for Utah County from Inter-Regional Corridor Alternatives Analysis (IRCAA) Study

In other study efforts that are not yet complete, MAG and UDOT are also examining options for Geneva Road between Pleasant Grove and Provo, 800 North in Orem between Geneva Road and US-189 at the mouth of Provo Canyon, and US-6 between Spanish Fork and Green River, Utah. Each of these studies is occurring concurrently with development of this *I-15 Corridor Management Plan*. Preliminary findings and recommendations from these studies were coordinated with this *I-15 Corridor Management Plan* if they were available during the study process.

2.1.4 Population and Employment

Most of the existing population and employment in Utah County is located along the east side of I-15. The largest cities in terms of population are Provo, Orem, American Fork, Pleasant Grove, Springville, Spanish Fork, and Lehi. **Table 2-3** summarizes existing population (year 2000 data) and projected population to the year 2030 by city in Utah County. As can be seen in this table, Utah County is expected to grow from an existing population base of more than 360,000 to 677,304 by the year 2030, which corresponds to an 83.8 percent increase in population over the 30-year planning horizon at an annual growth rate of 2.0 percent.

Utah County has the second largest population within the state of Utah, after Salt Lake County. In the last ten years, growth within the county has been significant. Based on a recently released analysis of the Census data comparing 2000 to 1990, the Provo metropolitan area was shown to be the fourth fastest growing metropolitan area in the United States for job creation and tenth fastest growing for population. Provo is projected to continue to be the largest city in Utah County with Orem the second largest. Projected growth in other cities such as American Fork, Lehi and Pleasant Grove will have them approaching 50,000 population by the year 2030. Extremely high growth rates are forecast for many of the small cities in Utah County, but this is a function of low existing population levels.

Table 2-3:
Population Growth in Utah County (Year 2000 to 2030) *

City	2000 Population	2030 Population	Change in Population (2000 to 2030)	
			Number	Percent
Alpine	7,146	14,309	7,163	100 %
American Fork	21,941	43,110	21,169	96 %
Cedar Fort	341	2,132	1,791	525 %
Cedar Hills	3,094	13,466	10,372	335 %
Draper	0	1,754	1,754	N.A.
Eagle Mountain	2,157	20,467	18,310	849 %
Elk Ridge	1,838	6,699	4,861	264 %

Table 2-3:
Population Growth in Utah County (Year 2000 to 2030) * (continued)

City	2000 Population	2030 Population	Change in Population (2000 to 2030)	
			Number	Percent
Genola	965	2,438	1,473	153 %
Goshen	874	1,320	446	51 %
Highland	8,172	24,548	16,376	200 %
Lehi	19,028	46,840	27,812	146 %
Lindon	8,363	15,931	7,568	90 %
Mapleton	5,809	11,433	5,624	97 %
Orem	84,324	112,204	27,880	33 %
Payson	12,716	36,203	23,487	185 %
Pleasant Grove	23,468	42,417	18,949	81 %
Provo	105,166	149,491	44,325	42 %
Salem	4,372	13,521	9,149	209 %
Santaquin	4,834	14,241	9,407	195 %
Saratoga Springs	1,003	8,580	7,577	755 %
Spanish Fork	20,246	40,928	20,682	102 %
Springville	20,424	35,694	15,270	75 %
Vineyard	150	739	589	393 %
Woodland Hills	941	4,078	3,137	333 %
Unincorporated Utah County	11,164	14,761	3,597	32 %
Utah County Total	**368,536**	**677,304**	**308,768**	**83.8 %**

* *Source: Mountainland Association of Governments*

Population density in residents per acre for the year 2000 is shown in **Figure 2-3** for the areas adjacent to the I-15 corridor; the 2030 population density is shown in **Figure 2-4**. As can be seen in these two figures, the population density is projected to increase along the I-15 and US-89 corridors, but densities in the remainder of the County are projected to remain below 5 residents per acre.

Employment forecasts for Utah County also show high growth rates between year 2000 and 2030. Existing employment in Utah County is 150,000 and is projected to grow to 274,000 by the year 2030, an increase of 82.7 percent at an annual growth rate of 2.0 percent. Existing employment densities in Utah County are shown in **Figure 2-5;** projected employment densities in year 2030 are shown in **Figure 2-6**.

Major activity centers in Utah County where these employees are located include:

- Brigham Young University

Figure 2-3:
Existing Population Density

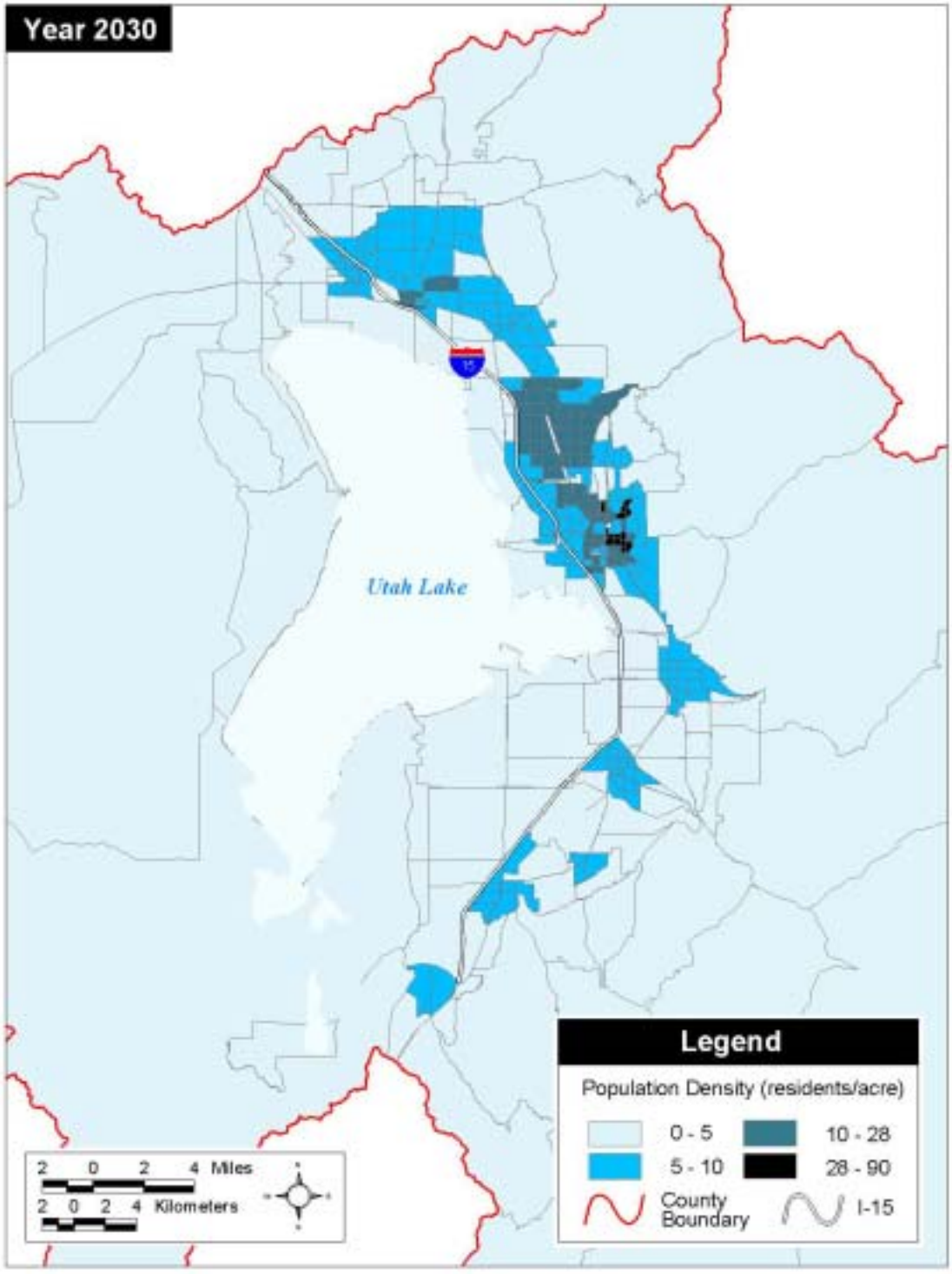


Figure 2-4:
Year 2030 Population Density

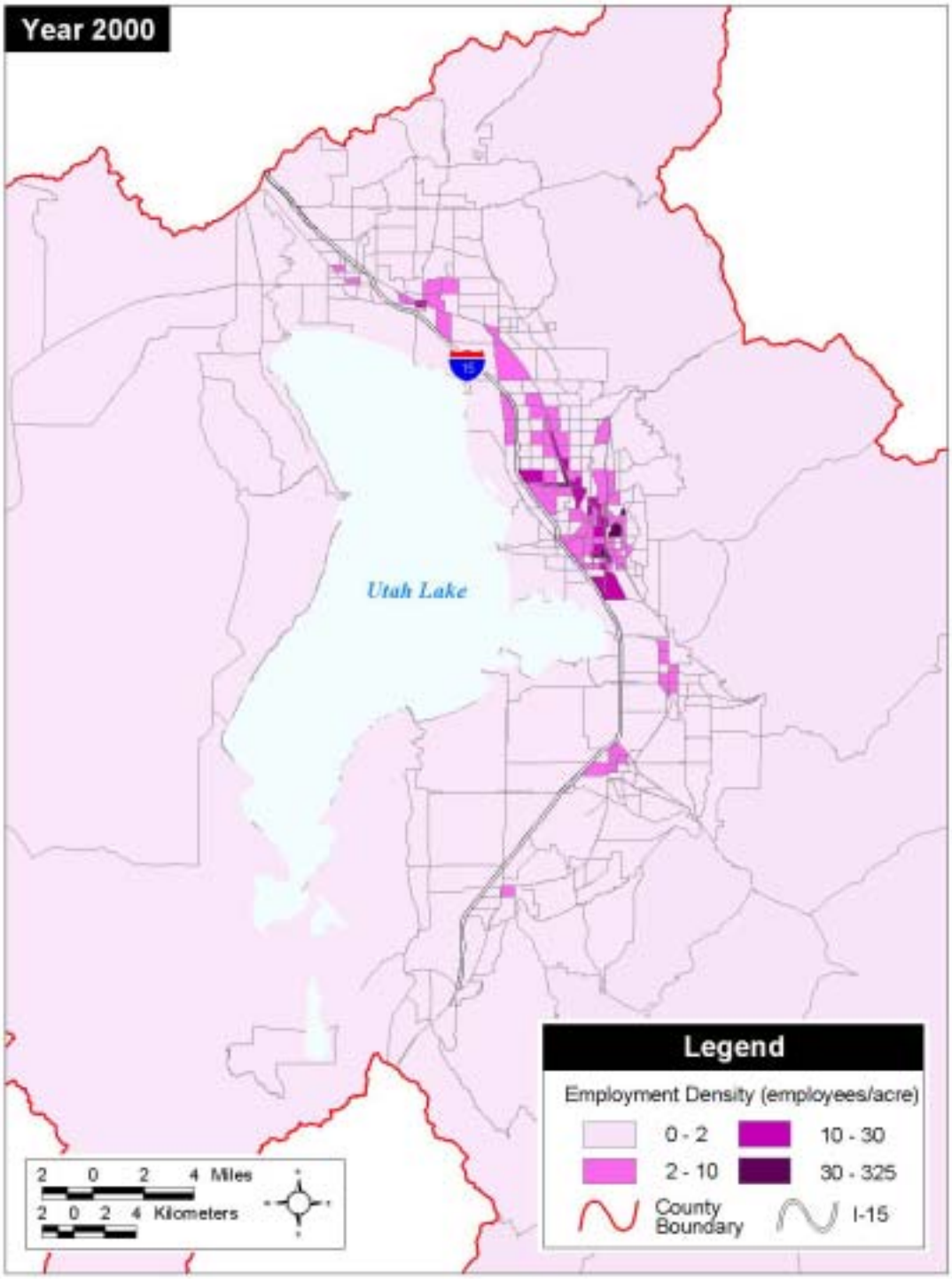


Figure 2-5:
Existing Employment Density

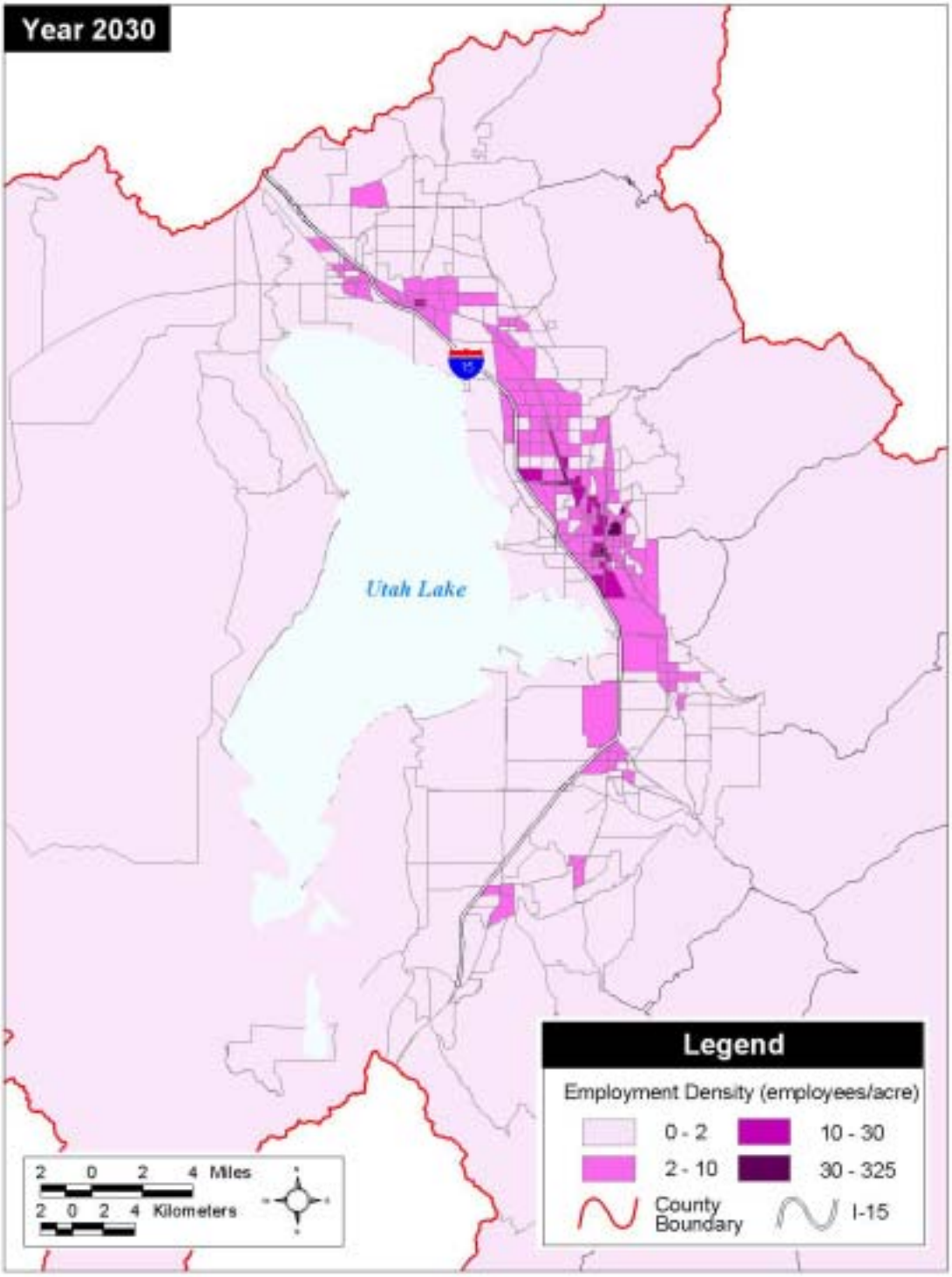


Figure 2-6:
Year 2030 Employment Density

- Utah Valley State College
- Downtown areas of Provo and Orem

As can be seen in **Figures 2-5** and **2-6**, the employment density increases are concentrated along I-15. Provo and Orem continue to be the major employment centers, but significant increases are also shown in the northern part of the county for Lehi, American Fork, and Pleasant Grove. In the southern part of the county, the communities of Springville, Spanish Fork, and Payson also show significantly increased employment densities by 2030.

2.1.5 Existing Traffic Conditions

2.1.5.1 2001 Traffic Data

Existing conditions traffic data and historic information about traffic conditions were collected throughout the project. Extensive traffic counts were collected by UDOT as part of this study effort. UDOT also provided historic data from their files for traffic conditions in previous years as well as current year traffic data from UDOT permanent traffic recording stations located on I-15.

Historical data on 24-hour traffic volume counts were available from UDOT for the interchange ramps within the study area over the four-year period from 1997 to 2000. These data are collected as part of UDOT's standard methodology for preparing the annual publication, *AADT's on Utah Interchanges*.

In addition, as part of this study effort, UDOT conducted 24-hour traffic volume counts at all interchange ramps in the study area. The majority of the counts were conducted during April and May of 2001 with additional counts conducted during the fall after completion of construction projects in the corridor. During the initial phase of traffic counts for this study (April and May of 2001), two interchanges in the Orem / Provo area were under construction. Once the construction in the area was complete, counts were taken at each interchange (October 2001), and the 2001 traffic count database was updated accordingly.

The historical data on traffic volumes were used as a check on the validity of the 2001 traffic counts. Also, at interchange locations where 2001 traffic counts were not collected until later in the study process, counts and Average Annual Daily Traffic (AADT) from previous years were factored to the year 2001 based on historical trends. The factoring process allowed for the inclusion of interchanges that initially were not counted, due to construction or other constraints. For the I-15 corridor, as construction projects were completed, the traffic count database was completed, and the AADT estimates were then updated based on the newer count data.

Supplemental turning movement counts were collected at ramp junctions throughout the study area for the peak hours of operation. These peak hour counts indicate the numbers of motorists turning or traveling through a given intersection. Also, two-way arterial counts were collected at each interchange to document traffic volume data available for the arterials approaching each interchange.

Appropriate seasonal factors from UDOT's permanent traffic recording stations were used to adjust the 2001 counts from weekly averages (as collected) to estimates of the annual average daily traffic or AADT. Once the data collection effort was completed, summaries of the existing conditions for traffic were prepared.

2.1.5.2 Estimates of 2001 Average Annual Daily Traffic (AADT)

The project team combined data from the sources identified above to develop estimates of average annual daily traffic (AADT) for 2001 throughout the project area. These 2001 AADT's are only considered to be estimates since final AADT's cannot be determined until all data from UDOT's permanent traffic recording stations have been analyzed for 2001. The Program Development Division of UDOT will develop the final traffic statistics for 2001 along I-15.

AADT Estimates for I-15 ramps

Ramp volumes based on the 2001 traffic counts throughout the corridor were adjusted using appropriate seasonal factors to arrive at AADT volumes. These volumes were then compared to historical data at ramps and turning movement counts performed at the ramp termini. Adjustments were made if necessary so that 24-hour AADT volumes were balanced for all freeway segments throughout the I-15 corridor.

A ramp screenline analysis was also performed. Screenline totals for the number of vehicles entering or exiting the freeway were checked to ensure that the total in a given direction was maintained during the balancing process.

AADT Estimates for I-15 Mainline

The traffic count data from the permanent traffic recording stations were adjusted for seasonal factors to obtain 2001 AADT volumes for the mainline lanes of I-15 at the count station locations. Between count station locations, volumes for I-15 were developed by adding and subtracting entrance and exit ramp volumes. Checks of the volumes calculated from one count station to the next were performed, and additional ramp volume adjustments were made as necessary to ensure balanced 24-hour AADT volumes for the I-15 corridor in the study area.

Summary of 2001 AADT Estimates

Figure 2-7 shows the 2001 AADT volumes on the I-15 mainline and ramps for the study area. Details of the historic data and 2001 AADT estimates by ramp are provided in the Appendices.

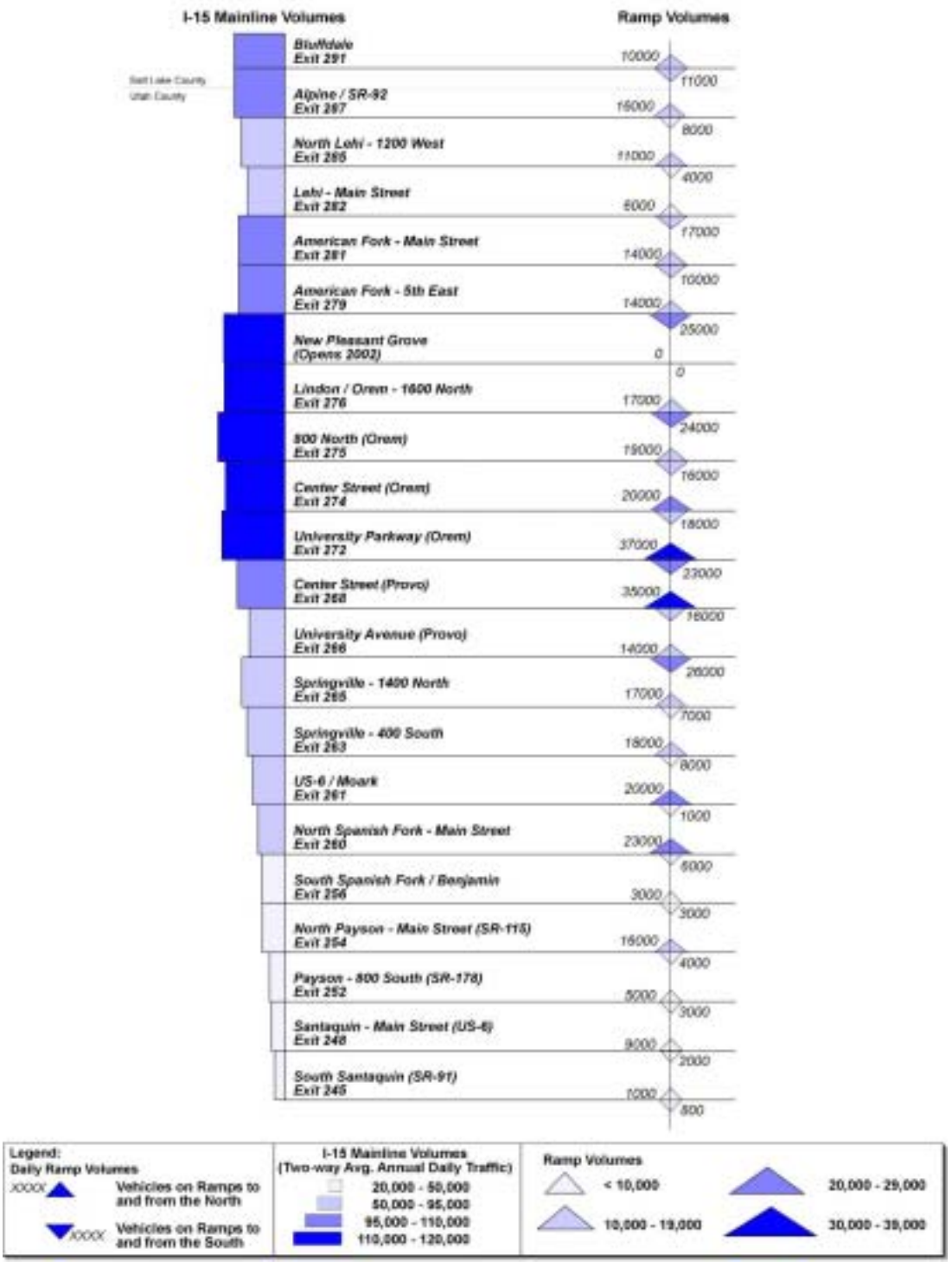


Figure 2-7:
2001 Traffic Volumes

2.1.5.3 Peak hour volumes

The project team used the peak hour percentages available from the ramp counts to factor the balanced daily volumes to peak hour volumes. This resulted in peak hour volumes for each ramp. Peak hour percentages at the permanent count stations were also evaluated to ensure that the individual ramp peak hour factors were reasonable. The arterial volume was also reviewed to ensure that the peak hour percentage remained consistent with traffic count data. The existing peak hour volumes for the I-15 corridor are provided in the Appendices.

2.1.5.4 Existing Traffic Operations

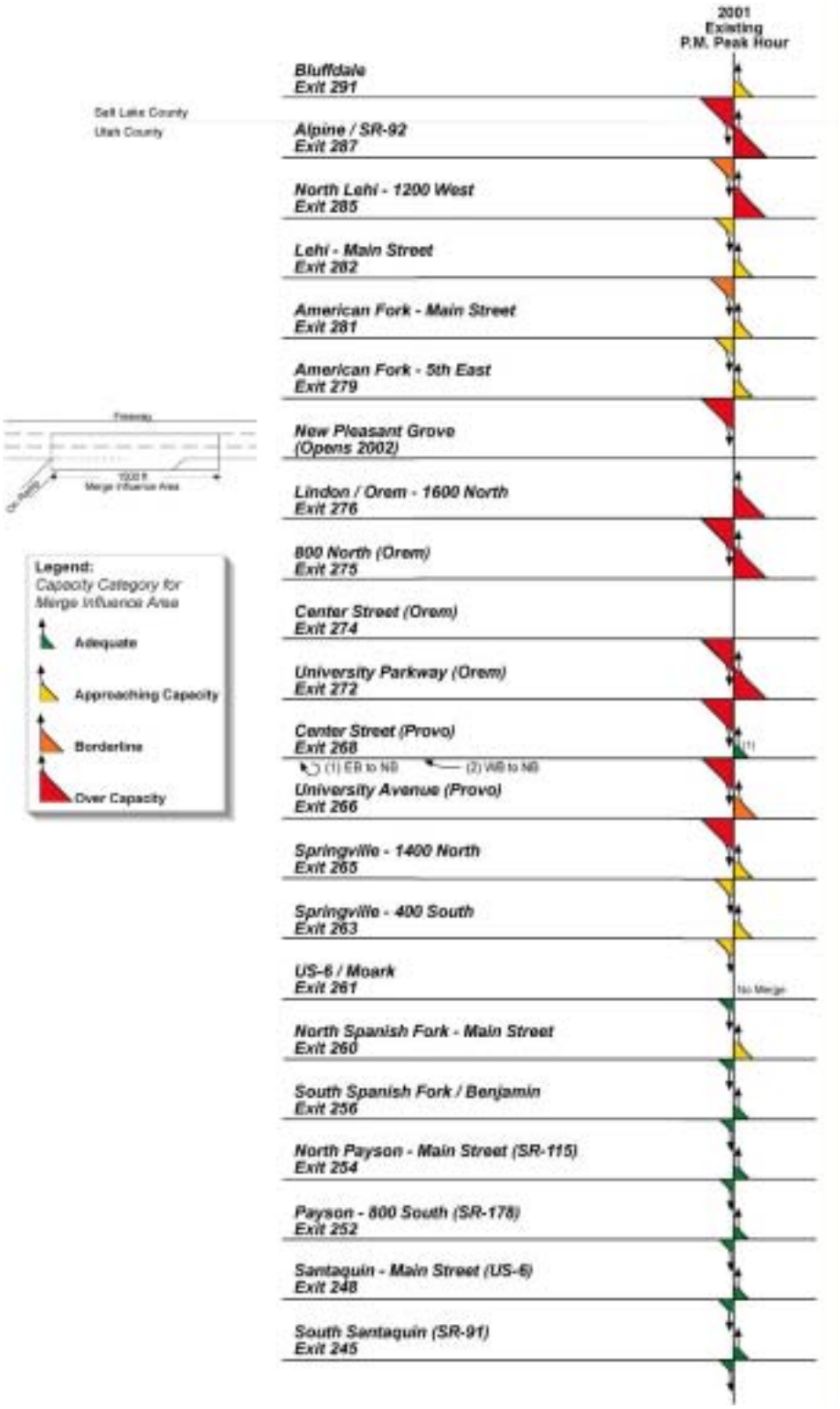
Existing traffic operations for the p.m. peak hour were evaluated for the I-15 mainline as well as the intersections of the ramps with the local arterial. For the I-15 mainline, a capacity screening process was used that looked at the merge influence area for the on-ramps to I-15. For ramp intersections, network delay calculations were performed based on techniques of the *Highway Capacity Manual (HCM) 2000*, a publication of the Transportation Research Board.

The methodology used for evaluation of traffic operations on the I-15 mainline used screening capacities for the merge influence area on I-15. The merge influence area is the freeway segment downstream of the point where an on-ramp merges with through lane traffic of the freeway, as defined in Chapter 25 of the *2000 HCM.* Typically, when capacity problems are occurring at the merge influence area, this is a good indicator of capacity constraints for traffic operations at the interchange. This capacity screening approach was used rather than more detailed traffic operation calculations since the *I-15 Corridor Management Plan* is developing recommendations for the 2030 study year. Developing 2030 traffic projections for the merge influence area was judged to be a reasonable task to assess traffic operations, and it would allow efficient use of project resources in evaluation of future scenarios for the I-15 corridor.

Table 2-4 summarizes the screening capacities that were used in the evaluation for the *I-15 Corridor Management Plan;* the results of the I-15 capacity screening for 2001 are shown in **Figure 2-8**.

2.1.5.5 P.M. Peak Hour for Ramp Intersections

Traffic operations for the p.m. peak hour at the ramp intersections with local arterials were also evaluated for existing conditions throughout the corridor. The intersections were analyzed using techniques from the *2000 HCM* to calculate the network delay for the area covered by the ramp intersections. The network delay was calculated by applying two traffic software packages: Synchro/Sim Traffic and CORSIM.



(Note: See Table 2-4 for Screening Capacity Definitions)

Figure 2-8:
I-15 Capacity Screening Results for 2001

Table 2-4:
Screening Capacities for I-15 Traffic Operations

Maximum Flow Entering Merge Influence Area* (vehicles per hour)	Capacity Category for Initial Screening of I-15 Traffic Operations	Proposed Action for I-15 Planning
Greater than 2200	Over capacity	Capacity improvements at interchange will need to be implemented, or new interchange access will need to be investigated.
2000 to 2200	Borderline capacity	Capacity improvements at interchange will probably need to be implemented
1600 to 2000	Approaching capacity	Evaluate peak hour traffic operations in more detail to determine if any interchange improvements are warranted.
Below 1600	Adequate capacity	Existing interchange configuration will adequately serve projected traffic volumes.

* *Merge Influence Area =*
Freeway segment downstream of point where an on-ramp merges with through lane traffic of the freeway, as defined in Chapter 25 of the Highway Capacity Manual (HCM) 2000. Since 30-year traffic projections are being developed for the I-15 Corridor Management Plan, the maximum flow rates are defined for one lane rather than the two lanes used in Exhibit 25-7 of the HCM.

Synchro is a software package that has been designed to model and optimize traffic signal timings. Synchro implements the methods of the *2000 HCM* for calculation of capacity analysis. In addition to *2000 HCM* calculations, the Synchro software can evaluate multiple signal timing plans to find the optimum conditions and can calculate the effects of coordinated signal timing with adjacent intersections. CORSIM is a software package developed by the Federal Highway Administration that simulates traffic operations in a network environment over time. Depending on the traffic conditions being evaluated, the consultant team selected the appropriate software package to evaluate traffic operations.

Using the methodologies of the *2000 HCM*, calculations were done to assess the average delay per vehicle that would occur during the p.m. peak hour. These delay calculations could then be translated into the following levels of services for intersections:

- **Level of Service A (LOS A)** – Describes operations with very low delay. Most vehicles do not stop at all.
- **Level of Service B (LOS B)** – Describes operations with higher levels of average delay than LOS A, but traffic operations are generally good.

- **Level of Service C (LOS C)** – Describes operations with higher levels of delay, and the number of vehicles stopping is significant at this level.

- **Level of Service D (LOS D)** – Describes operations where the influence of congestion becomes more noticeable. Many vehicles stop, and the proportion of vehicles not stopping declines.

- **Level of Service E (LOS E)** –Describes operations where high delay values occur, and the ratio of volume of traffic using the intersection versus the capacity is also high. The level of delay begins to be unacceptable under LOS E.

- **Level of Service F (LOS F)** – Describes operations with average delay values that are unacceptable to the average driver. Arrival flow rates often exceed the capacity of the intersection and severe levels of congestion occur.

Table 2-5 presents the evaluation results of existing traffic operations at ramp intersections throughout the I-15 corridor using these categories for LOS.

Table 2-5:
Traffic Operations for Existing Ramp Intersections
P.M. Peak Hour (Year 2001)

Interchange	Total Veh./Hour at Intersection Approaches	Network Delay (seconds per vehicle)	Level of Service
287 – Alpine / SR-92	2,308	121.3	F
285 – North Lehi (1200 W / 2100 N)	1,860	12.5	B
282 – Lehi Main Street	3,810	17.4	C
281 – American Fork / Main St.	2,510	25.7	D
279 – American Fork / 5th East	2,814	55.2	E/F
276 – Lindon / Orem (1600 N / SR 241)	3,388	211.7	F
275 – Orem (800 North / SR 52)	3,675	80.6	Slightly over F
274 – Orem (Center Street)	4,300	69.3	Slightly over F
272 – University Parkway	6,515	39.0	D
268 – Provo (Center Street)	5,208	27.3	D
266 – University Avenue	3,600	32.4	D
265 – North Springville	1,958	15.1	C
263 – South Springville	3,426	24.4	C
261 – US-6 / Moark	1,800	52.9 (combined analysis)	E/F
260 – North Spanish Fork	2,602		
256 – South Spanish Fork	612	5.1	B
254 – North Payson / Benjamin	1,950	64.7	Slightly over F
252 – South Payson	684	4.8	A
248 – Santaquin	744	9.3	B
245 – South Santaquin	158	5.9	B

As can be seen in **Table 2-5**, five interchanges along the I-15 corridor already have peak hour traffic operations that fall into the LOS F category, which translates into severe congestion. Two interchanges are also showing congestion levels in the E/F range where traffic operations are beginning to be unacceptable.

2.1.6 Structural Conditions

Ninety-seven (97) structures along I-15, including the interchanges, were examined as part of this study effort. A visual inspection of each structure was made as well as a review of the bridge sufficiency reports maintained by the UDOT Structure Division. Based upon the review, each structure was placed in a category that represented expected remaining serviceable life. Serviceable life is the remaining time estimated that a structure can function satisfactorily before it is either replaced or rehabilitated. An assessment of whether the structure would accommodate widening of I-15 was also made.

Based upon this evaluation of structural conditions, the 97 structures were classified into the following categories:

- 34 structures have an expected serviceable life of less than ten years
- 31 structures have an expected serviceable life of less than twenty years
- 32 structures have an expected life of more than twenty years.

Figures showing the approximate location of all 97 structures along I-15 are included in the Appendices. These figures show the UDOT-assigned structure number which can be correlated to the type of structure along with the category of expected service life for that structure.

As discussed in Section 2.2, 2030 Traffic Forecasts, widened cross-sections of I-15 have been assumed to be required by the year 2030. In locations where I-15 will be widened, the majority of the structures cannot accommodate the wider cross-section. This may create the need to replace many of these structures before the end of their expected serviceable life.

This classification of I-15 structures was used to identify phasing options for the *I-15 Corridor Management Plan*. In areas where widening of I-15 was proposed, the condition and geometry of each structure were evaluated and a recommendation for widening or replacement of the structure made. The cost of either action is included in the cost estimates prepared for the *I-15 Corridor Management Plan*. Where a problem with the existing structure was identified, a recommendation for accelerated rehabilitation or replacement of the structure is included in the recommendations. In areas where widening was not proposed, the condition assessment was used to recommend repairs or replacement of structures due to the condition of the structures.

2.1.7 Pavement Conditions

The existing pavement was evaluated to determine its condition and to assess the feasibility of reusing the pavement in the future. An assessment was also made to identify any conditions that would dictate an early replacement of any portion of the pavement for either structural or safety issues.

Existing UDOT pavement condition and evaluation information was obtained and reviewed for the corridor. UDOT also conducted an evaluation of condition and recommendations for maintenance activities for the pavement. The consultant team collected this information and prepared a condition report for use in developing the *I-15 Corridor Management Plan*. The full report is available in the project files and included the following findings:

- The northern most three (3) miles are Portland Cement Concrete.
- The remainder of the corridor is bituminous asphalt.
- Two sections of poor or very poor ride were identified near:
  - Santaquin.
  - Salt Lake County Line.
- Structural capacity of the existing pavement was generally good.
- With regular maintenance and periodic overlays and pavement rehabilitation, it is expected that the pavement can be maintained in acceptable condition throughout the study design life period.

The conditions of the pavement were taken into consideration as options for widening and reconstruction were developed. In most areas within the corridor, the pavement condition is good enough so that pavement replacement will not cause a section of I-15 to become a priority for programming improvements. However, as widening was considered, cost estimates were prepared to reflect reconstruction of the interstate since the design profile will most likely change.

2.1.8 Crash/Accident Analysis

Safety issues of existing roadways were identified through the evaluation of historical data on traffic crashes/accidents. For the I-15 corridor, data on crashes/accidents for the past three years (1998-2000) were obtained for the mainline lanes on I-15 and for the cross streets at the I-15 interchanges. The data were reviewed to evaluate the safety of the existing facility, locate areas where either the rate of accidents or their severity was higher than expected, and determine whether geometric changes to the system could reduce or eliminate an identified safety issue. Where higher than expected accident rates were encountered, the type of accident and location were studied in more depth to determine possible causes related to the

geometrics of the facility or other conditions that could be modified to improve the conditions.

The corridor was divided into segments corresponding to the interchanges. Each interchange segment included the interchange and the mainline portions adjacent to the interchange (up to the midway point for the adjacent interchange). The cross streets were investigated separately. For I-15, accident rates were calculated as the number of accidents per million-vehicle-miles for the 3-year period of 1998 to 2000; these accident rates are shown in **Figure 2-9**.

On the I-15 mainline, where higher than expected rates of crashes occurred, shorter subdivided segments (such as the segment around the "S" curve in Provo/Orem) were examined to see if possible causes for the higher crash rate could be identified.

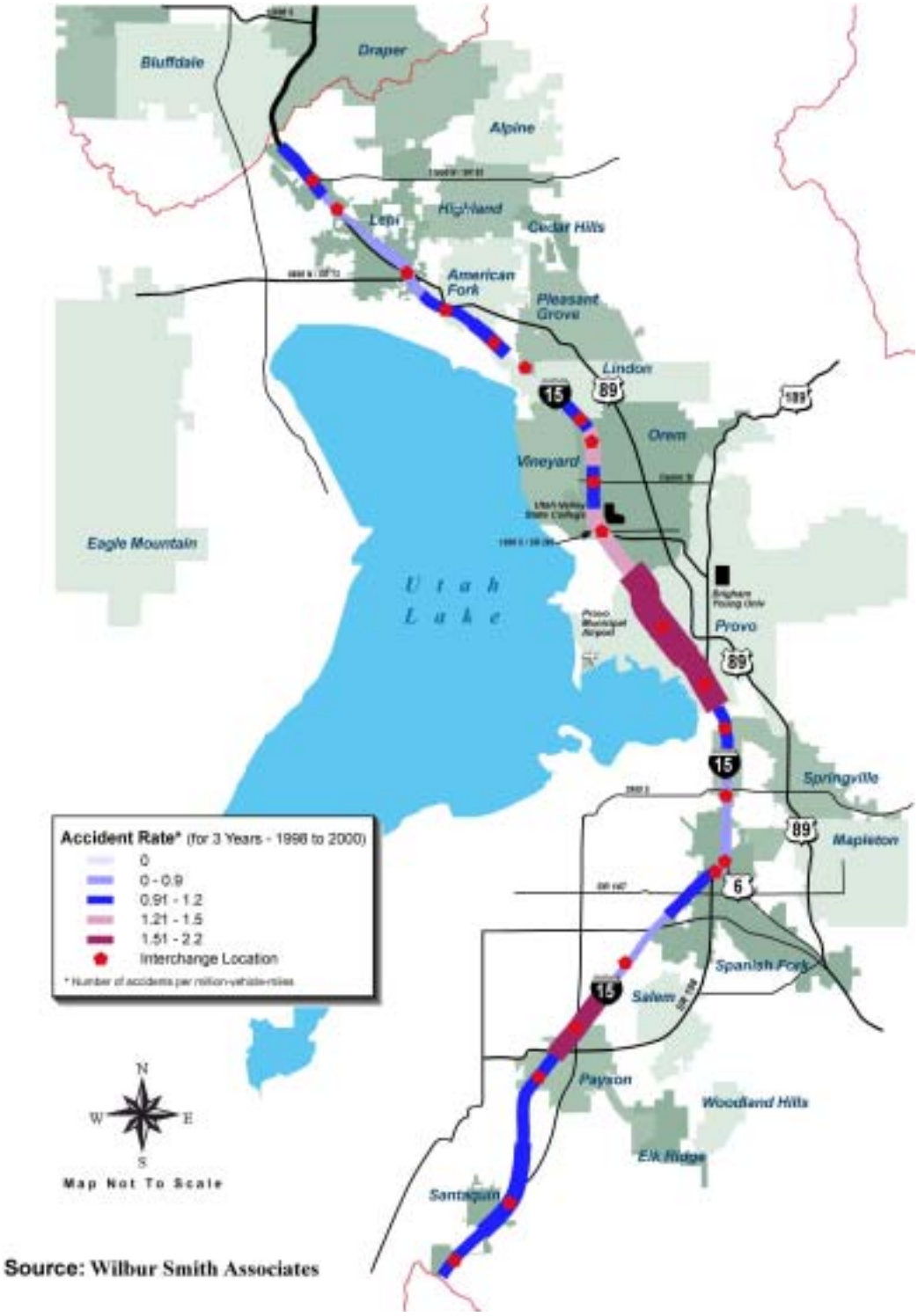
The following locations on I-15 were identified as having higher than expected crash rates and where possible solutions should be studied:

- Top five mainline segments including an interchange with an accident or severity rates higher than expected:
  - Center Street in Provo
  - University Avenue in Provo
  - North Payson-Benjamin Interchange
  - South Spanish Fork Interchange
  - North Spanish Fork/US-6 Interchange areas
- Other mainline segments where potential safety issues were identified include:
  - "S" curve segment in Provo/Orem
  - 600 South Provo bridge structure

The accident analysis showed that the majority of mainline accidents on I-15 were caused by merging traffic and by traffic slowing to exit the mainline. Other than these merge/diverge accidents, a higher than expected number of accidents occurred at the "S" curve segment in Provo, north of Center Street.

The evaluation of accidents on the cross streets at interchanges showed the following five locations as the highest ranked segments where the accident rate on the cross street is higher than expected:

- SR-73 (Exit 282) at Lehi
- SR-115 (Exit 254) at North Payson
- SR-52 (Exit 275) at 800 North in Orem
- 1600 North (Exit 276) in Lindon
- SR-180 (Exit 279) at 500 East in American Fork



Source: Wilbur Smith Associates

Figure 2-9:
Accident Rates on I-15 (1998 to 2000)

The cross street accidents were largely conflicts between left turns and through movements. Either left turn bays of insufficient length are provided, or left-turning vehicles did not clear the intersection. Some safety issues were also identified at ramp intersections where no traffic signals are installed for traffic control, and these were identified as locations where traffic signal installation needed to be evaluated.

The consultant team used the results of this analysis in developing options for interchange or mainline reconfiguration to address the identified safety concerns.

2.2 2030 Traffic Forecasts

During the *Needs Assessment* phase, 2030 traffic forecasts were developed for a baseline condition that assumed no major improvements at I-15 interchanges and that no new interchanges were constructed. This 2030 Baseline scenario was used to help identify future needs for additional I-15 access in the next phase of the study process and to provide a basis for comparison of other build scenarios.

2.2.1 Travel Demand Model

Travel forecasts for all scenarios were developed with a travel demand model. A travel demand model is a widely accepted planning tool that forecasts traffic volumes and other mobility characteristics.

Assumptions about future land use are one of the basic inputs for a travel demand model. Projections for population and employment in the future study year of 2030 were developed by MAG as part of their long-range transportation planning process. Related growth assumptions were discussed in a previous section of this chapter. More detailed information about these socio-economic projections is also available in the *Utah Valley Interim Long Range Transportation Plan 2000-2030*.

A series of travel demand model runs of alternative scenarios was conducted to provide a reference for current I-15 corridor traffic conditions and to assess projected traffic for 2030 conditions. The network assumptions for each alternative scenario were defined by the consultant team and transmitted to MAG staff for coding and execution of the appropriate model run. Each travel demand model run, its related assumptions, and purpose are described below.

Existing Conditions (year 2000 land use) – This initial run was conducted with the MAG year 2000 roadway network and land use estimates. The scenario represented the closest approximation to existing conditions to serve as a benchmark for adjusting year 2001 traffic counts. Due to interchange construction and modification activities along the corridor, traffic counts would ultimately be refined to reflect estimated traffic conditions subsequent to the completion of these interchange improvements.

Existing Conditions plus Under Construction (E + UC) – This model run also employed the MAG year 2000 land use estimates but reflected a roadway network that included the New Pleasant Grove interchange (scheduled to open in Summer 2002), plus the reconstructed University Parkway and University Avenue interchanges in Provo. Capacity improvements along I-15 that were completed during 2001 were also coded in the network for this model run. The results from this run were used to make adjustments to year 2001 traffic counts by reflecting the redistribution of traffic as a result of interchange improvements.

2030 Baseline – A 2030 Baseline model run was conducted to develop a reference for travel demand growth rates and to subsequently assess the impact of 2030 projected land use on an "Existing Conditions plus Under Construction" interchange scenario. The 2030 Baseline scenario was also developed to serve as a benchmark for testing new interchange connections for impacts to travel patterns and traffic distribution. While the interchange configuration was consistent with existing and current improvements, the mainline lanes of I-15 were coded to reflect improvements recommended in *the Inter-Regional Corridor Alternatives Analysis (IRCAA) Study*. This was done in order to recognize the additional demand attracted to I-15 due to future planned capacity improvements. The three connections recommended by the *North Valley Connectors Study (NVCS)* were also coded as part of the 2030 Baseline network.

2.2.2 Redistribution of 2001 Traffic with Under Construction Improvements

Since the new Pleasant Grove interchange (currently under construction) will not be completed before recommendations from this study effort are made, traffic for existing conditions at this interchange was estimated. The following steps were undertaken:

- Travel model run information was used to develop traffic diversion estimates with the new interchange in place.
- 2001 AADT's were redistributed to develop an E+UC scenario.

First, the travel demand model for the study area was run for existing conditions (without the interchange). A second run was completed using existing conditions plus the new Pleasant Grove interchange with I-15 and including the proposed connections from the interchange to the local street system. The differences between these runs in the areas adjacent to the new interchange were calculated as percentages.

Based on the percentage changes developed from the model runs, the existing AADTs for 2001 were modified to reflect the new interchange. The percentage changes were applied to the AADTs developed from the 2001 traffic counts, and the resulting volumes were reviewed for reasonableness.

2.2.3 2030 Baseline Projections

Using information from the 2030 Baseline model run, growth factors for each mainline and ramp segment were derived by comparing the "Existing Conditions plus Under Construction" and "Baseline 2030" model runs. These growth factors were applied to 2001 "redistributed" AADTs under the E+UC scenario. Minor refinements to the projected 2030 AADT volume were made as needed to maintain a balance between interchanges. In addition, on- and off-ramp screenline control totals were analyzed to maintain appropriate volumes to/from I-15. The resulting 2030 traffic projections are shown in **Figure 2-10** along with the 2001 "redistributed" volumes under the E+UC scenario.

Using the 2030 daily volume projections as a starting point, future peak hour traffic projections were developed by applying estimated peak hour characteristics. A combination of I-15 mainline, I-15 ramp and local arterial assumptions were used to establish future turn movements at intersections where I-15 interchange ramps connect to local arterials.

Peak hour characteristics were analyzed for current conditions (based on traffic count data) and for future scenarios (based on travel demand model runs). Key characteristics included peak hour percent of daily traffic, peak hour directional split at intersection locations and intersection turn movement distribution. Shifts from existing conditions to the future forecasts were estimated based on trends identified from the model runs and through references to travel characteristics in other areas that have matured as urban areas.

Projected volumes for the p.m. peak hour were first developed for the on- and off-ramps to I-15 along with the mainline lanes of I-15. Summaries of these peak hour projections are provided in the Appendices. Peak hour projections were then developed for the turning movements at ramp intersections.

The projected volumes for the p.m. peak hour were used to apply the screening capacities presented in **Table 2-4** for the I-15 mainline in 2030. The resulting capacity constraints are shown in **Figure 2-11**. As can be seen in this figure, significant portions of the I-15 corridor are projected to experience over-capacity traffic operations under the 2030 Baseline scenario.

Results of the evaluation of peak hour traffic operations for 2030 at the ramp intersections are presented in Chapter 5, Corridor Evaluation.

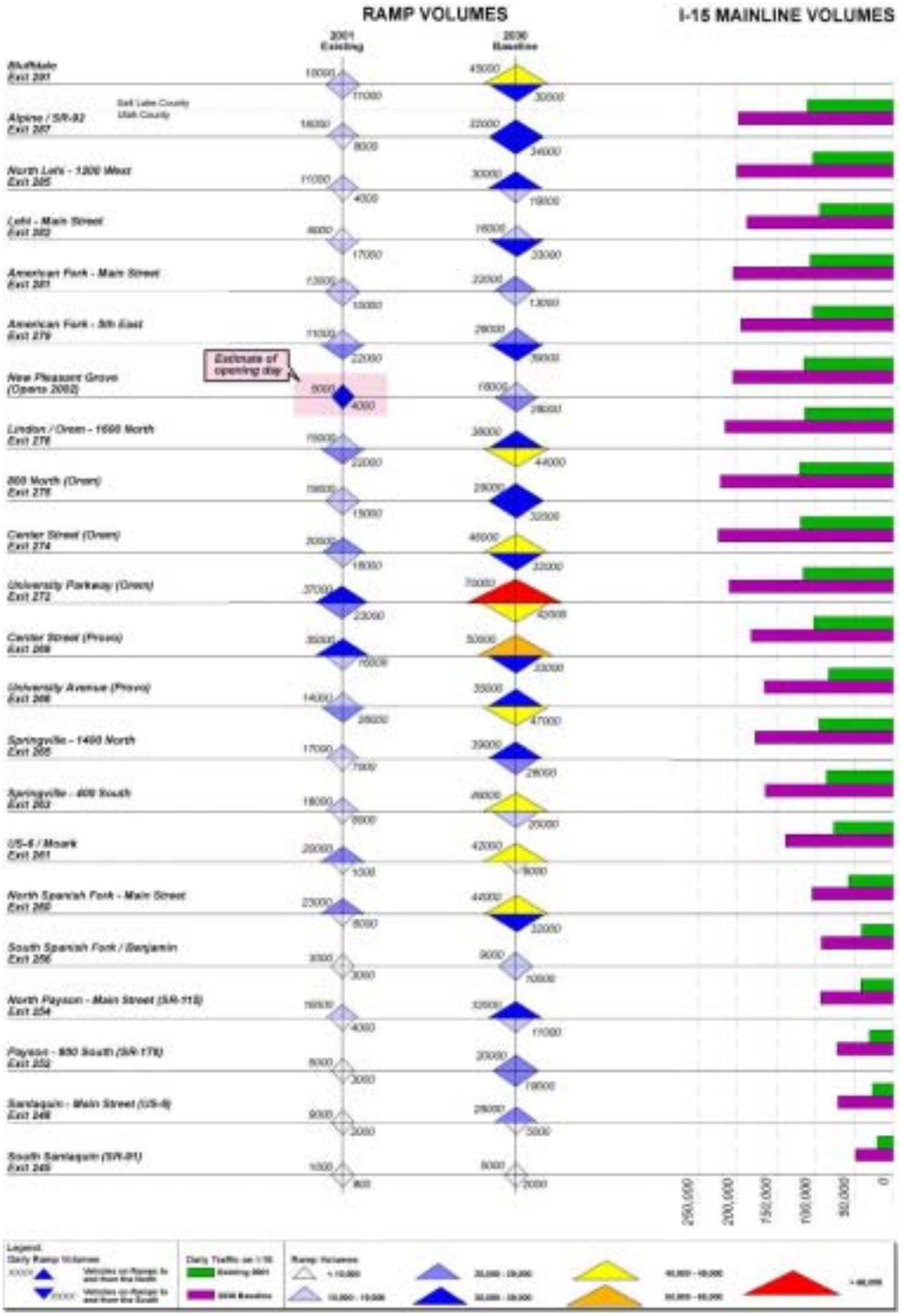
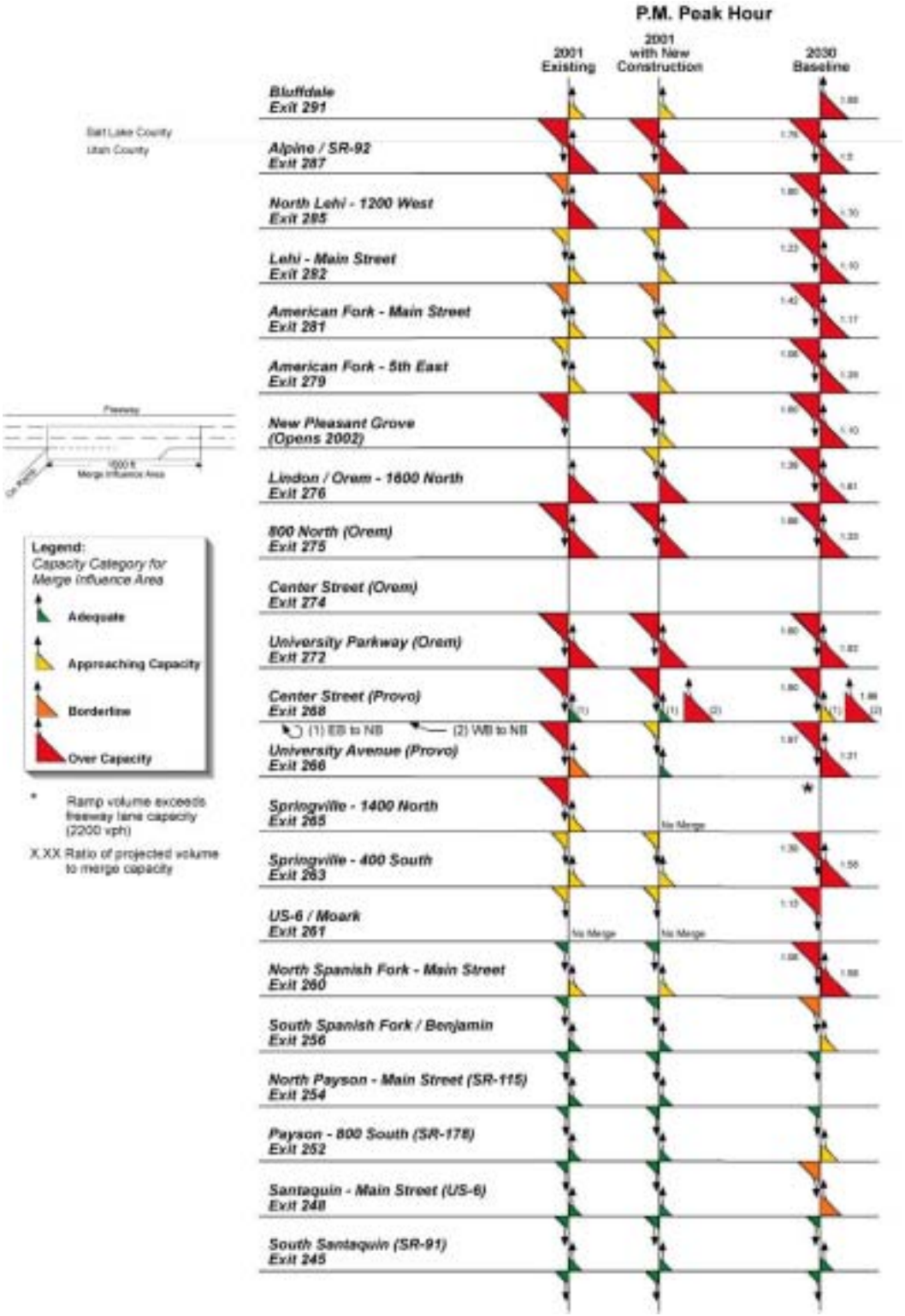


Figure 2-10:
Existing and 2030 Daily Traffic Volumes



(Note: See Table 2-4 for Screening Capacity Definitions)

Figure 2-11:
I-15 Capacity Screening Results

2.3 Public and Agency Input

2.3.1 Summary of Process

In June 2001, a public process was established for the development of the *I-15 Corridor Management Plan*. The process provided the public with several opportunities to express interests, concerns, and perspectives during the initial phase of plan development.

During the *Needs Assessment* phase of the project, the public involvement process consisted of many components including:

- A partnering session with stakeholders from affected jurisdictions and management agencies;
- A Working Group to provide local stakeholders the opportunity to be a part of the decision-making process throughout plan development;
- Five focus group sessions with highway users, planners, state and federal agencies, economic development organizations and special interest groups;
- A Utah County Public Opinion Survey;
- Three public workshops to identify public and agency issues held in American Fork, Orem and Payson; and
- A project Web site – www.utahcountyi-15.com -- to give out information and to receive comments.

Chapter 7 provides additional information on the public involvement activities and tasks.

2.3.2 Issues Identified

Development of the *I-15 Corridor Management Plan* was based on solving problems and building on opportunities that were identified during the public involvement process. **Table 2-6, Issues Identified During Public Input Process,** provides a summary by general issue area of the comments received during this process.

2.3.3 Application of Public Input

The issues identified by the public and agency input were summarized on maps of the corridor, by general subject area and in matrix format. The summaries of all input received during the *Needs Assessment* phase can be found in the Appendices. All issues identified were provided to the Working Group as they considered corridor-wide options for I-15 and more conceptual alternatives for improvements to specific interchanges.

Table 2-6:
Issues Identified During Public Input Process

General Issue	Comments Received
Air Quality	Provo City and Orem City are designated as a moderate non-attainment "area" for carbon monoxide and Utah County is designated as a moderate non-attainment "area" for particulate matter (PM_{10}). There is concern that any increased vehicle miles traveled (VMT) would impact air quality. *I-15 Corridor Management Plan* recommendations should be coordinated with the Utah Division of Air Quality.
Alternative Routes	There is desire to provide an alternate north/south four-lane transportation artery through Utah County - for example, extending Legacy Highway or the 5600 West corridor along the west side of the Utah Lake. If an alternative route is developed, there is a need for access to it from the mainline. It was suggested that land for an alternate route be purchased now. There is a desire to consider Redwood Road a belt route for Utah County.
Collector Roads	There is concern that access to Sandhill Road is difficult. Roads running parallel to Independence Avenue in Provo need to connect to Sandhill Road to alleviate congestion. There is a desire to widen Sandhill Road from 2000 South Orem to 1430 South to help alleviate congestion at the University Parkway interchange. An exit only slip ramp could be provided to connect I-15 to Sandhill Road. Congestion resulting from traffic traveling to UVSC could use the signalized intersection to cross University Parkway. Geneva Road and US-89 are bumper-to-bumper when there is an accident on the freeway. There is a desire to widen Geneva Road and to improve congestion, safety and access. Main Street in Lehi becomes very congested as it is used for local traffic as well as a collector road for east-west traffic.
Congestion	The mainline is congested during commute times, weekends, holidays, and during accidents. Seventy-two percent of respondents from the survey identified traffic congestion as a pressing concern and feel that in 10 years it will be a serious concern if no major changes are made. There is a concern that the trucking industry will dramatically increase in the future, and that will significantly increase mainline congestion. There is concern about congestion at the on- and off-ramps. Specifically mentioned were the new Pleasant Grove/Lindon off-ramp, the northbound off-ramp to Main Street in American Fork and various Provo off-ramps. There is also a concern that the majority of off-ramps are not signalized and that there is a need to consider signals at all interchanges to regulate the flow of traffic. However, the trucking industry stated that flyover ramps are better than SPUI ramps because the truckers have a difficult time negotiating signals. It was also suggested that there is a need to evaluate the synchronization of signals at interchanges.
Construction	There is concern about the lack of I-15 alternate routes during road construction. Freeway reconstruction worked in Salt Lake County because there were alternate city streets to use to avoid freeway construction. This will not be possible in Utah County. Existing construction has caused considerable frustration. Future construction needs to facilitate access and minimize travel concerns. A desire for public information and education during and after construction was expressed. It was also suggested that any construction be accelerated and an alternate transportation facility — another freeway, commuter rail or light rail — be identified and constructed before shutting down the I-15 mainline for construction. There is a desire that I-15 reconstruction begin on the northbound side first and occur on one side of the mainline at a time. It was suggested that information on construction and alternative routes be highlighted in newspapers, on local access TV stations and radio to help alleviate congestion.

Table 2-6:
Issues Identified During Public Input Process (continued)

General Issue	Comments Received
East-West Access	There is a need for improved east-west access for cities that are bisected by I-15 - such as American Fork - to accommodate the growth that is occurring west of I-15. There is a desire to widen SR-73 from Lehi through Eagle Mountain. However, Lehi City is concerned because the western communities use Main Street as a thoroughfare to provide freeway access. Deliveries to the west are difficult because of the congestion and lack of alternate routes. While there is a need for more east-west access, it does not necessarily need to be additional interchanges. It was suggested that cross-overs could work as well. Eagle Mountain and Cedar Fort to the west and Elk Ridge and Genola to the east were specifically mentioned as needing better access. There is a concern about the difficulty in crossing the freeway south of Center Street in Provo.
Funding	There is a question about the need or possibility of toll roads. There is a desire for increased transit; however, there is a concern that UTA funding in Utah County is by city, not by a countywide vote. There is a need for public awareness of the total transportation cost up front, and a desire to get all the funding possible from the federal government.
Geneva Road	There is a desire to improve Geneva Road in order to help reduce local use of the freeway and to provide an alternative route. However, concern was expressed about the need to provide an overpass for the train tracks because there are safety and congestion problems where the Union Pacific tracks cross Geneva Road at 4th North in Orem.
Growth	Forty-two percent of those surveyed identified "growth" as the top issue facing Utah County, which is currently experiencing a population growth of 13,000 to 14,000 per year—75 percent due to birth, and 25 percent immigration. There is concern that I-15 does not have enough capacity to handle existing growth. There is a desire to incorporate Envision Utah's growth projections for 2030 into this plan. Several areas have been identified as major growth areas: west of Utah Lake (Eagle Mountain), Saratoga Springs, south of Camp Williams, Highland, Cedar Hills, UVSC (enrollment is expected to double during the next 10 years), west of Santaquin near the southwest Interchange, and Mapleton. Although growth has slowed in the south part of the county and will continue to slow until economic opportunities for jobs are offered, the northern part of the county is filling up and growth will be pushed south. While most interested companies ask about the north part of county, there are increasing economic development inquiries for South County where prices aren't as high. Since many people associate urban sprawl with interchanges, it will be important to consider the effect of an interchange on the surrounding area.

Table 2-6:
Issues Identified During Public Input Process (continued)

General Issue	Comments Received
Interchanges – General	All interchanges are outdated and should be evaluated. There is a concern that the volume of traffic at peak times doesn't work with the current design. However, of the people surveyed, 82 percent indicated that they feel "very safe" or "somewhat safe" on Utah County interchanges, and 92 percent of respondents indicated that interchange congestion is "a slight problem" or "a considerable problem." While some people suggested a new interchange is needed between Provo Center Street and University Parkway, others disagreed. Concerns were expressed that a new interchange at 1740 North in Provo would result in safety issues because of increased cut-through traffic and the impacts on the adjacent elementary schools. Some people also suggested a need for an interchange in Provo at 8th North, while others disagreed. There is a desire for a new interchange for Mapleton. There is a question about whether the overpass by the airport road would be a possible solution. There is also a desire for a new interchange in Springville. Evaluating the effects of adding additional interchanges on mainline traffic is an issue. The proximity of existing exits in some areas is also an issue. There is a need at interchanges to allow emergency vehicles to change traffic signals as needed to give preference to emergency vehicles (OPTICOM was the suggested technology). The desire was expressed that planners consider the use of roundabouts or cloverleafs and a need to review of all interchanges for appropriate signals Providing direct access to the freeway for UVSC and BYU is an issue. And there is a desire to reconnect the hook access ramp from UVSC to northbound I-15 on-ramp.
Alpine/SR-92 interchange (Exit 287)	The interchange is not signalized, is difficult to make left turns, and is congested with vehicles heading east toward Alpine and Highland.
North Lehi interchange (Exit 285)	There is a desire to redesign the interchange and to improve the connection between State Street and the west frontage road. There is a desire to implement the 2100 North east-west connector to this interchange prior to the south Lehi alternatives. However, there is concern that a new east-west connection could overload the interchange.
Lehi – Main Street/SR-73 interchange (Exit 282)	The northbound off-ramp is difficult to negotiate because of the curve. Because there is no signalization, turning left toward Highland and American Fork off of the northbound off-ramp is difficult during the afternoon rush hour. Those desiring access to West County communities find travel difficult because of Main Street congestion; however, those living in Lehi are concerned because Main Street is used as a thoroughfare.
American Fork – Main Street interchange (Exit 281)	The interchange functions minimally – especially during the afternoon rush hours - and should be upgraded. There is a need to coordinate with American Fork City regarding access for ramps. The information on the exit sign needs to refer to American Fork and not Lehi.

Table 2-6:
Issues Identified During Public Input Process (continued)

General Issue	Comments Received
American Fork – 5th East interchange (Exit 279)	All of the growth in American Fork is southwest of the freeway and the overpasses/underpasses are too narrow. There is a need to upgrade 500 East overpass because it is a blind hill and there are safety and congestion issues. The 625 South approach median is not extended far enough. This interchange functions minimally – especially during the afternoon rush hours - and should be upgraded. There are choke points and a signal needs to be considered. Getting on and off of the interchange is difficult; people going into the adjacent industrial park must do a U-turn.
New Pleasant Grove interchange (Opens 2002)	Construction of a new interchange to the south of the existing Sam White overpass is occurring, and American Fork City is opposed to the removal of the existing Sam White overpass and wants it preserved and rebuilt. There is concern that the interchange will be congested as soon as it opens. However, there is also concern about the impacts of the new interchange. Some stated they thought it was premature to construct the interchange. There is a desire to upgrade the connector roads (200 North in Pleasant Grove and 700 North in Lindon) to reduce congestion in the area.
Lindon / Orem interchange (Exit 276)	There are congestion and safety concerns on 1600 North as trucks leaving Geneva Steel go northbound and enter the mainline. There is a desire to increase capacity of the interchange especially for the Geneva Steel traffic. There is a need for a signal at the southbound ramp. There is concern about truck acceleration and merge on the ramps.
Orem – 800 North interchange (Exit 275)	There is a need to improve the interchange. 800 North is a truck route from I-15 to Provo Canyon (US-189) and is congested. The 1200 West frontage road conflicts with eastside ramps and the northbound off-ramp backs up during rush hour. There is a need to keep traffic moving from the off-ramp because traffic backs up onto the freeway, and a desire to make the interchange similar to American Fork 500 East. The stop signs cause congestion. An alternative route from Provo Canyon for trucks should be explored and others suggested removing commercial truck traffic from Provo Canyon. There are concerns that Orem is taking all the canyon traffic and there is a need to share traffic burden with Provo City.
Orem – Center Street interchange (Exit 274)	There is a desire to increase southbound to eastbound capacity at the interchange by adding double left turn lanes. Traffic backs up onto the mainline during congested periods. The interchange should be redesigned similar to American Fork 500 East. However, off-ramp traffic light is a problem for trucks. There is a concern that 1200 West is too close to the ramp.
University Parkway interchange (Exit 272)	The interchange needs to be evaluated. There is concern that there is only one lane to get on northbound from westbound - and a question about whether additional lanes would be possible. There is a concern that westbound to northbound traffic crosses a sloping lane. The merge north of University Parkway needs to be lengthened. The interchange is confusing, dangerous and needs more striping, signage, and education. There is a question about whether the speed limit is too low. There is a desire to reconnect the "hook" ramp and to provide direct access to and from Utah Valley State College (UVSC).
Provo – Center Street interchange (Exit 268)	There is a desire to increase capacity. The interchange is poorly designed, the bridges are old, and it is difficult getting traffic in and out. The exit ramp southbound is confusing and requires truckers to stay right. The sharp turn off Provo Center Street northbound to westbound is a concern. There is a desire to reconstruct interchange instead of replacing. There is a concern that people do not know that they have to yield quickly on and off northbound traffic at Provo Center Street. There is a question whether there should be restrictions on Center Street - the main access to the airport.

Table 2-6:
Issues Identified During Public Input Process (continued)

General Issue	Comments Received
University Avenue interchange (Exit 266)	There is a concern that the new off-ramp is already obsolete and that the interchange is confusing, needs more stripping, signage and education. There is a desire for emergency vehicle cross-over.
South Springville interchange (Exit 263)	Congestion occurs on the ramps during peak times and with the frontage road. There is commercial development planned along the frontage and cross-roads, and there is concern that the congestion will get worse. There is a desire for traffic signals and a question about making the road a cloverleaf.
US-6 / Moark interchange (Exit 261)	It is difficult to detour traffic in this area during an emergency. Westbound traffic to southbound and northbound has a difficult time merging because of the high-speed traffic. There are also merge issues with US-6.
North Spanish Fork – Main Street interchange (Exit 260)	There is a desire to upgrade the interchange, to improve access to US-6 or provide a separate interchange for US-6. Northbound traffic going to US-6 must use an uncontrolled intersection resulting in safety concerns. When you exit the mainline to go east to Price, you have to travel across Main Street, making it very congested. When you exit the freeway, the configuration goes from three southbound lanes to two, creating a merge problem for vehicles going to US-6. There is a desire to widen the roadway under the bridge.
South Spanish Fork interchange (Exit 256)	There is a desire to upgrade 2700 North at the South Spanish Fork interchange.
North Payson interchange (Exit 254)	The southbound exit is a concern and there are questions about the need for stop signs, better signage, or a roundabout in the area. There is a traffic conflict, which leads to safety concerns between the access to Flying J and the ramp traffic. Trucks back up on the ramp waiting to get into the facility. The intersection needs to be reviewed for signals and pedestrian safety. There are additional safety concerns because of the proximity of the freeway to homes. There is a question about whether sound walls can be used for safety purposes.
South Payson interchange (Exit 252)	There is a safety concern with eastbound traffic as the road goes from four lanes to two lanes. There is a desire to slow traffic down. There is a question about mowing practices on UDOT right-of-way.
Santaquin interchange (Exit 248)	Rapid growth is occurring in North Santaquin, and there is a need for additional access points to I-15. The eastside frontage road is too close to the ramp entrance.
South Santaquin (Exit 245)	There is concern about future development to the west of I-15 causing congestion.

Table 2-6:
Issues Identified During Public Input Process (continued)

General Issue	Comments Received
I-15 Mainline	Planners were urged to make sure that all the transportation options are discussed and not just road-building options. There is a desire to continue the Salt Lake County I-15 concept of the freeway from 106th South to Payson to help alleviate the bottleneck at 106th South in Salt Lake County. There is a need for adding more lanes, including High Occupancy Vehicles (HOV) lanes. However, there is a question about whether reversible lanes in the center of the mainline would work better than HOV. There is a desire to extend the Salt Lake County HOV lane down through Utah County - of those surveyed, 8 percent said car pool lanes are "definitely" or "probably" a viable solution to traffic congestion in Utah County. However, there is a concern that lanes, including HOV, should not be added if it means condemning or losing homes adjacent to I-15. If HOV lanes are added, there is a desire for public education on their proper use. It is suggested that if the HOV lanes originating in SLC County are not extended, then the impact on Utah County traffic needs to be evaluated. Survey respondents indicated that "more lanes on I-15" is highest on their list of priorities for Utah County's overall transportation system. Widening the mainline is critical if you add and improve interchanges. There is a need to add interchange exit lanes to maintain through lanes and additional lanes in congested areas in Orem and Provo, such as 800 North and 1600 North. There is a desire to improve the aesthetics of I-15 and concern that sound walls diminish the scenic quality of the area. However, others want the use of sound walls considered in residential areas. Some question why state and federal dollars are used for sound walls, especially if neighbors decide whether they go in or not. There are lighting, safety and noise issues resulting from the poor quality of the pavement and lighting between the Point of the Mountain and Lehi/Main Street Interchange. Several people expressed safety concerns about mixing pedestrian and bike access to the freeway. If bike paths are to be considered, it was suggested that they be located near UVSC or Utah Lake. However, the adequacy of non-motorized facilities is a question. Allowing trucks to bypass meters and installing meters to regulate flow of traffic onto the freeway are issues.

Table 2-6:
Issues Identified During Public Input Process (continued)

General Issue	Comments Received
Overpasses / Underpasses	There is a need to evaluate and upgrade or provide new overpasses. Specifically, Center Street in American Fork; 100 West, 300 West, Main Street and 600 East overpasses in Lehi; and the Main Street Interchange and 820 North underpass in Provo should be evaluated. There is a need for signs on the overpasses to identify the major roads. Flyover ramps are better for truckers than SPUI ramps because truckers have a difficult time negotiating signals. Better access to the airport is an issue. However, in a comment letter received from the U.S. Army Corps of Engineers, it was requested than any road system providing connection from I-15 to the Provo Airport should avoid Provo Bay (sometimes referred to as Provo East Bay) wetlands to the maximum extent practicable. Wildlife officials requested that designing and using certain bridges as bat habitat be considered as an option.
Landscaping	Enhancing the landscaping along the freeway is an issue. The landscaping on I-215 between I-15 and State Street is an example of how landscaping improvements could be made.
Park and Ride Lots	American Fork is currently preparing a park and ride plan, and coordination should occur with this study. There is a desire to increase and expand existing park and rides with easy access for buses on and off I-15. The planning for park and rides should occur in conjunction with other mass transit options. There are possible park and ride locations at 6400 North 620 East (opposite Treatment Plant) and at the Center Street interchange in Provo.
Planning Process	There is a desire to coordinate the results of this study with the cities for future planning. Because this is a 30-year plan, it was recommended that a schedule for revisiting and revising the plan should be included in the *I-15 Corridor Management Plan*. Several people suggested that there is no one solution and that planners will have to look at all the options, including mass transit, additional roads, and maintenance. Concern was expressed that even with a plan in place, once construction begins there will be litigation. For example, those opposed to a new interchange at 1740 North in Provo interchange have already indicated that they will litigate. Exploring and disclosing the impacts of I-15 expansion is an issue. There is a question about whether money will drive the decision-making process.
Public Involvement	Involving and listening to the public during the planning process is an issue.
Signage	There is a desire for better signage marking upcoming exits and identifying alternate routes, and a general need for new signage along the freeway. Locations specifically mentioned were: - Provo Center Street interchange, - The tight merge on University Parkway, - Center Street exits (confusion between Orem Center Street and Provo Center Street), - Along the median to prevent U-turns, and - Directing motorists to alternate routes. There is a desire to provide the new public information via radio, variable message signs or CommuterLink reader boards.

Table 2-6:
Issues Identified During Public Input Process (continued)

General Issue	Comments Received
Safety	While 79 percent of survey respondents said they feel "very safe" or "somewhat safe" on the freeway, many safety issues were raised. There are concerns that speeds are too high, a need for increased enforcement to reduce speeding and accidents, and a desire for more drivers education. There is concern that the access to north Lehi is dangerous and difficult to access for emergency vehicles (1200 West). The lack of alternative routing if the freeway is closed is a concern and there is a need for crossover access, especially between Center Street Provo and University Parkway. In high traffic areas, congestion and unsafe driving lead to the greatest number of accidents. Rush hour problems are not so much speed-related, but more merge and lane shift issues. There is a general concern that the deep barrow pits along the freeway and the lack of shoulders result in accidents. The 1600 North embankment specifically is an issue because of the possibility of motorists falling off the embankment; guardrails are need there for safety purposes. There is concern about the number of trucks on the freeway and the anticipated increase in trucking and congestion resulting from the Cana-Mex Highway. There is a question about providing lower speed limits for trucks. However, the trucking industry is opposed to implementing different freeway speeds for trucks and automobiles. Concerns were raised about the financial burden this places on truckers. There is a need for better striping, increased lighting, and better signage on the freeway. There is a desire for more rest areas in Utah County. Truckers are required to stop every two hours or every 100 miles, and there is currently no officially designated public rest area along the Utah County mainline for truckers to stop - although many utilize commercial locations such as the Flying J for this purpose. On surface streets, railroad crossings are a safety issue. There is a need to coordinate with the railroads, as there are a number of places where the rails are close to the freeway. There is a concern about easement issues. The issue was raised that more turn-arounds for emergency service vehicles and the Highway Patrol would be beneficial. There is a safety concern with the "S-curve" area located between the University Parkway and Provo Center Street interchanges. There are a higher number of accidents in the area. It is especially a problem for triple trucks, and it was suggested that the curves be straightened. Lighting, striping and the movement of traffic should be improved at the Point of the Mountain. There is a safety/speed concern with slower vehicles/trucks as they climb the hill on each side, and a desire for auxiliary lanes. Several suggested that another corridor should be identified through Point of the Mountain; one person suggested a tunnel from Thanksgiving Point to the prison. There is a question about whether SR-92 should be extended to funnel traffic from the Point of the Mountain.

Table 2-6:
Issues Identified During Public Input Process (continued)

General Issue	Comments Received
Mass Transit	There is a desire that mass transit be emphasized and improved in Utah County. Of those surveyed, 75 percent said rail would provide a viable solution to traffic congestion, and 59 percent said buses would. There is a desire for greater mass transit service, with increased frequency connections, more stops, and better scheduling. Many suggested providing increased bus service, extending light rail, establishing commuter rail and one suggested monorail. Some suggested doing light rail first – before expanding freeway. There is a concern that expanding the freeway is a "band-aid" approach. There is a need to explore methods to get people off the freeway, and a desire to make sure that bus and rail mass transit options connect. Several people expressed a need to buy right-of-way for mass transit as soon as possible. Several people commented that additional incentives should be considered for private companies to provide independent transit/shuttles/carpools.
Water Quality	Water quality in streams, wetland and Utah Lake for plants, wildlife, and humans is an issue. Reconstruction of I-15 is as an opportunity to upgrade the Provo River water diversion to include a fish ladder.
Wetlands	The wetlands of Provo Bay are extremely important to the aquatic environment. All efforts should be made to avoid any water quality or physical impacts to those wetlands. Any possible road system providing connection from I-15 to the Provo Airport should avoid Provo Bay wetlands to the maximum extent practicable. There are many stream crossings along the I-15 corridor, and any rebuilt crossings should not increase velocity during high flows, disrupt the passage of aquatic species, or negatively affect any endangered species such as the June Sucker. The existing roadway has already negatively affected ground water flow from east to west. Any further construction should seek to optimize groundwater flow from east to west in such a way that the system operates as close to natural conditions as possible, including work to restore lost groundwater function due to past I-15 construction. However, any such work should be carefully studied to avoid negatively affecting existing mitigation areas. The Mill Pond wetland complex is important to the aquatic ecosystem and should be avoided to the maximum extent practicable. Beer Creek wetland should be avoided to the maximum extent practicable. Creation of a wetland bank to enhance some of the more important wetland systems along the I-15 route should be considered to provide wetland mitigations for highway impacts. There is a desire that UDOT help the wetland Banking program through condemnation because the hardest thing for conservation agencies to do is to buy land. There is a need for coordination with current US Fish and Wildlife Service and Utah Division of Wildlife Resources mitigation efforts around Utah Lake. Salting of roads is a concern around wetlands and stream crossings.

2.4 Study Goals, Objectives and Evaluation Criteria

As one of their first tasks, the Working Group considered goals and objectives for the *I-15 Corridor Management Plan*. The following goal was developed in consultation with the Working Group for the study effort and was accepted at the October 11, 2001 meeting.

Goal: Develop plan to meet the long-term (2030) transportation needs for the I-15 Corridor in Utah County.

To achieve this goal, the following objectives were also developed:

- Provide for current and projected mobility needs.
- Maximize person moving capacity.
- Optimize safety for corridor users.
- Integrate I-15 improvement with local community plans and other agency plans.
- Minimize environmental impacts.
- Recommend cost-effective improvements.

The goals and objectives that were accepted by the Working Group membership were also presented to the Utah Valley Regional Planning Committee on November 8, 2001 and were accepted by that body.

During the *Needs Assessment* phase, potential evaluation criteria were also discussed that would help the Working Group to determine if the study objectives were being met. These evaluation criteria are presented in **Table 2-7.**

Table 2-7:
Evaluation Criteria

Goal

Develop Plan to Meet Long Term (2030) Transportation Needs for I-15 Corridor in Utah County

Objectives	1. Provide for Current & Projected Mobility Needs	2. Maximize Person Moving Capacity	3. Optimize Safety for Corridor Users	4. Integrate I-15 Improvements with Local Community Plans and Other Agency Plans	5. Minimize Environmental Impacts	6. Recommend Cost-Effective Improvements
▪ Evaluation Criteria	▪ Delay (Vehicle hours of delay) ▪ Travel Times ▪ Average Speed ▪ Volume/ Capacity (Density)	▪ Total Users ▪ Carpool ▪ Transit	▪ Design Standards (Structural pavement, geometric, etc.) ▪ Address high accident locations	▪ City Master Plans ▪ County Plan ▪ MAG – Long Range Transportation Plan ▪ North Valley Connector Study ▪ IRCAA ▪ UTA	▪ Air Quality (VMT, Speeds) ▪ Noise (Proximity to sensitive land uses) ▪ Wetlands (Acres, by type) ▪ R.O.W. (Acres, Units) ▪ Visual (Sensitive view sheds) ▪ Wildlife (Acres of habitat) ▪ Environmental Justice ▪ Quality of Life	▪ Total Cost ▪ Cost per Hour of Delay Reduced ▪ Cost per User